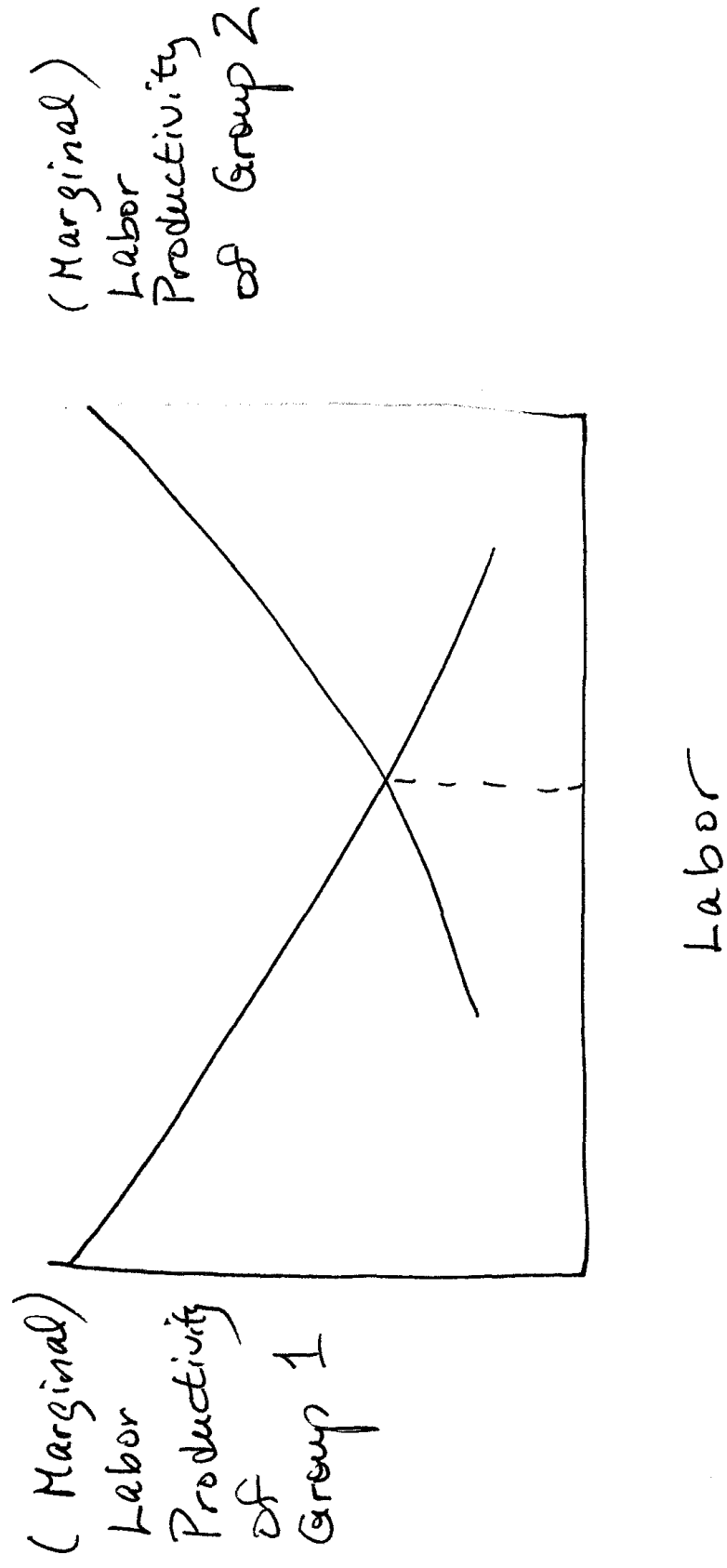


Thursday April 24th

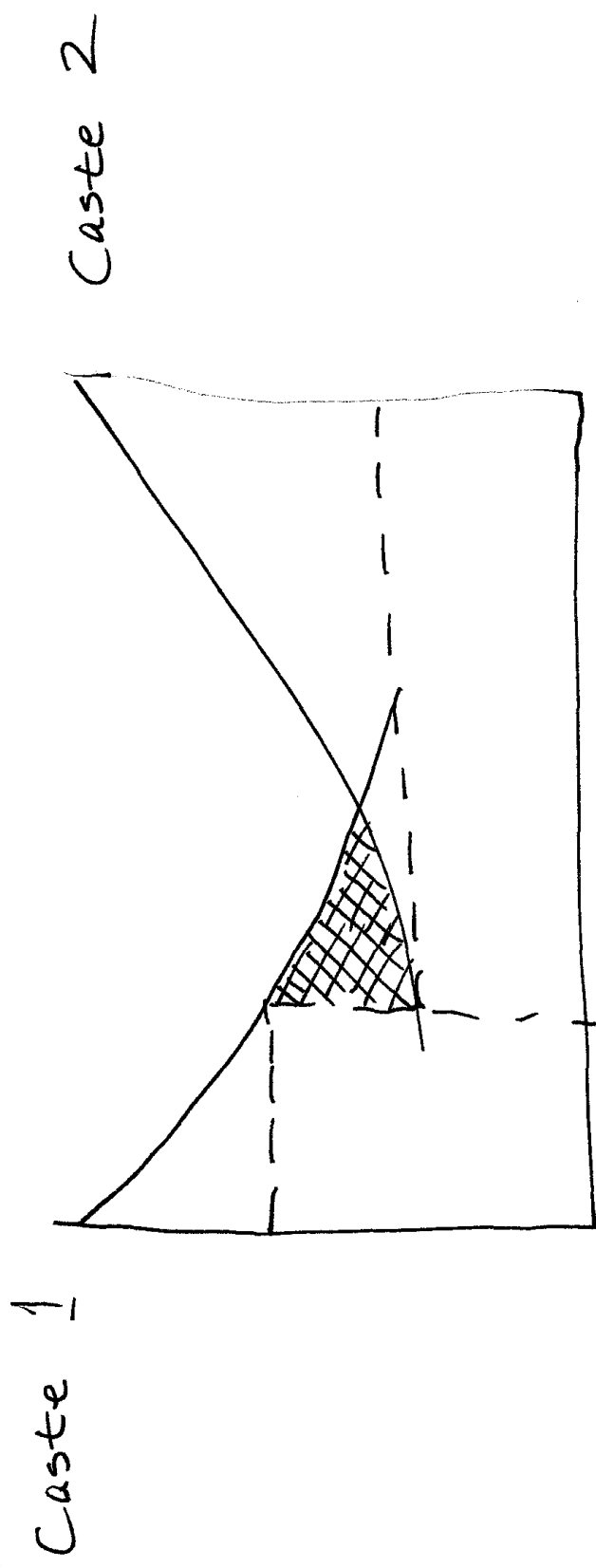
**Roots of Divergence and
Convergence**

First, a little bit of review

Here's a labor market without restrictions on mobility



And here's a labor market with
such restrictions



Over the course of the semester, we have seen evidence of convergence for some countries but not others

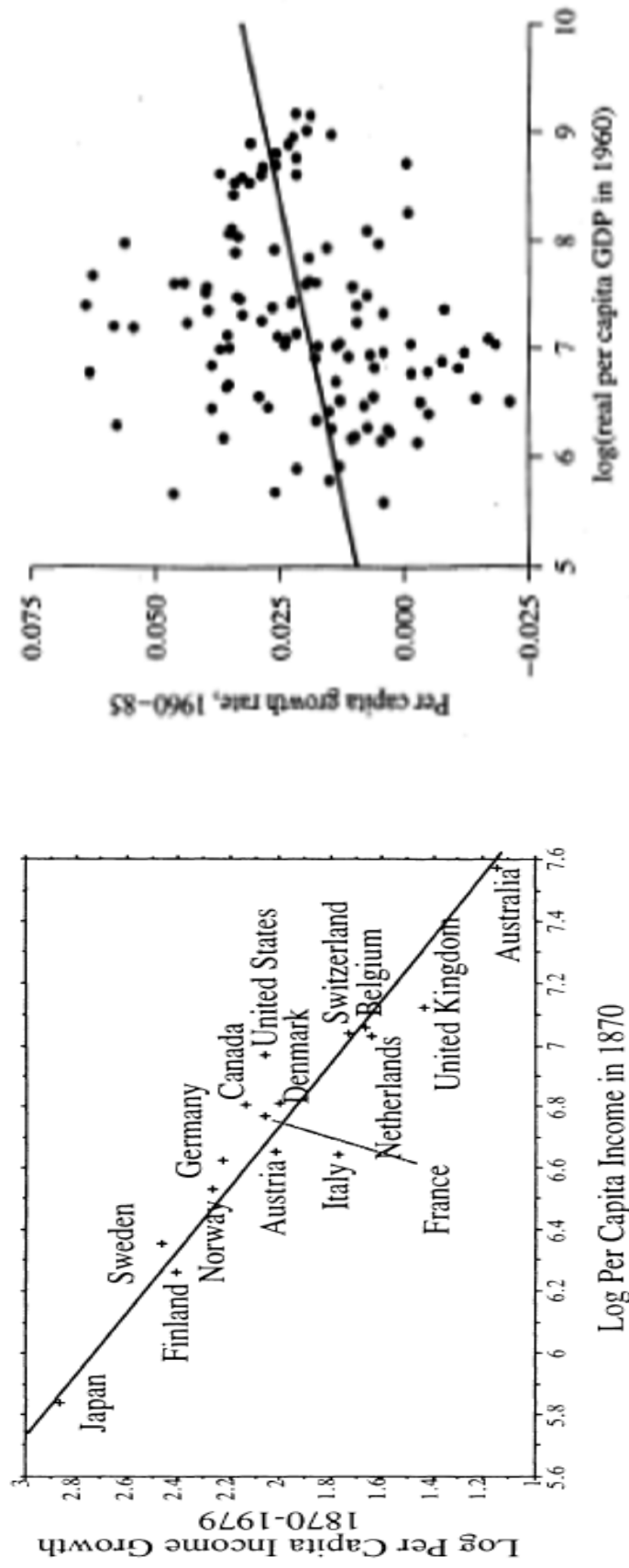


FIGURE 1. PER CAPITA GNP REGRESSION FOR MADDISON'S SIXTEEN

- This has led economists to dump the concept of unconditional convergence suggested by Baumol in favor of “conditional convergence” or for the idea of a “convergence club.”
 - But what determines membership in this club?
 - The answer, it would appear is that there are important prerequisites for embarking on modern economic growth and thus for membership in the convergence club.
 - Economists have long since debated the particulars of those prerequisites (Rostow’s “preconditions for takeoff,” the “Washington Consensus reforms”).
 - That said, there is broad agreement on what they entail:
 - A functioning market economy
 - Reliable contract enforcement and investor rights
 - Stable macroeconomic policies
- » Although we will see next week that some recent experiences, for example that of China, are difficult to square with this view.

- The deep question, then, is why some countries but not others manage to put these prerequisites in place. The literature offers three broad answers:
 - Burden of geography
 - Burden of colonialism

Geography

- We have seen previously how geography may have militated in Europe's favor.
 - Europe's geography provided natural protection against outsiders.
 - It militated against a centralized state.
 - But the internal barriers it created were not sufficiently high to prevent mobility of labor and capital (which encouraged efficiency enhancing competition among states) or cooperation among states to repel outsiders.
 - It provided long coastlines, navigable rivers, coal and iron deposits, and a benign disease environment, and a climate capable of supporting high agricultural yields.

Perhaps geography was less beneficent to other regions

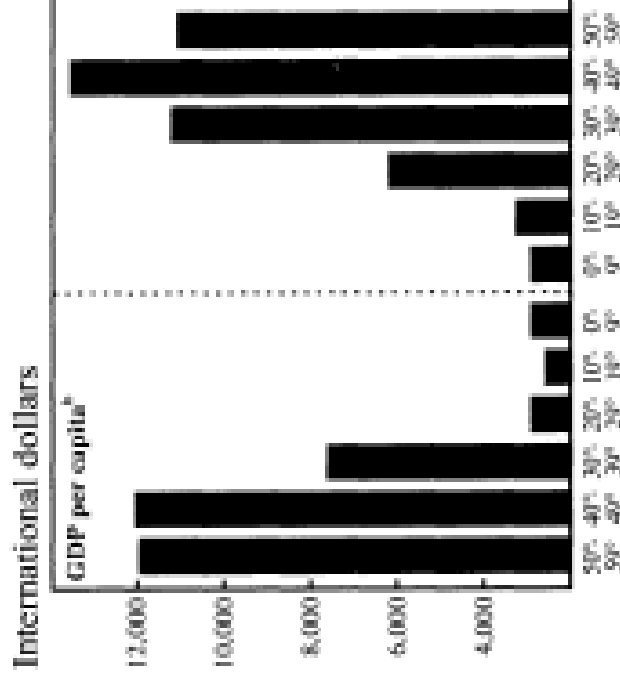
- India had fewer navigable rivers, larger arid regions separating its states (something that hindered cooperation).
- China had less natural protection against invaders and a geography more conducive to state centralization.
- Much of Africa was landlocked and malaria infested.

– Substantial parts of South Asia, Africa, the Caribbean and Latin America were located in the tropics, which meant less fertile soil, torrential rains, and a less benign disease environment

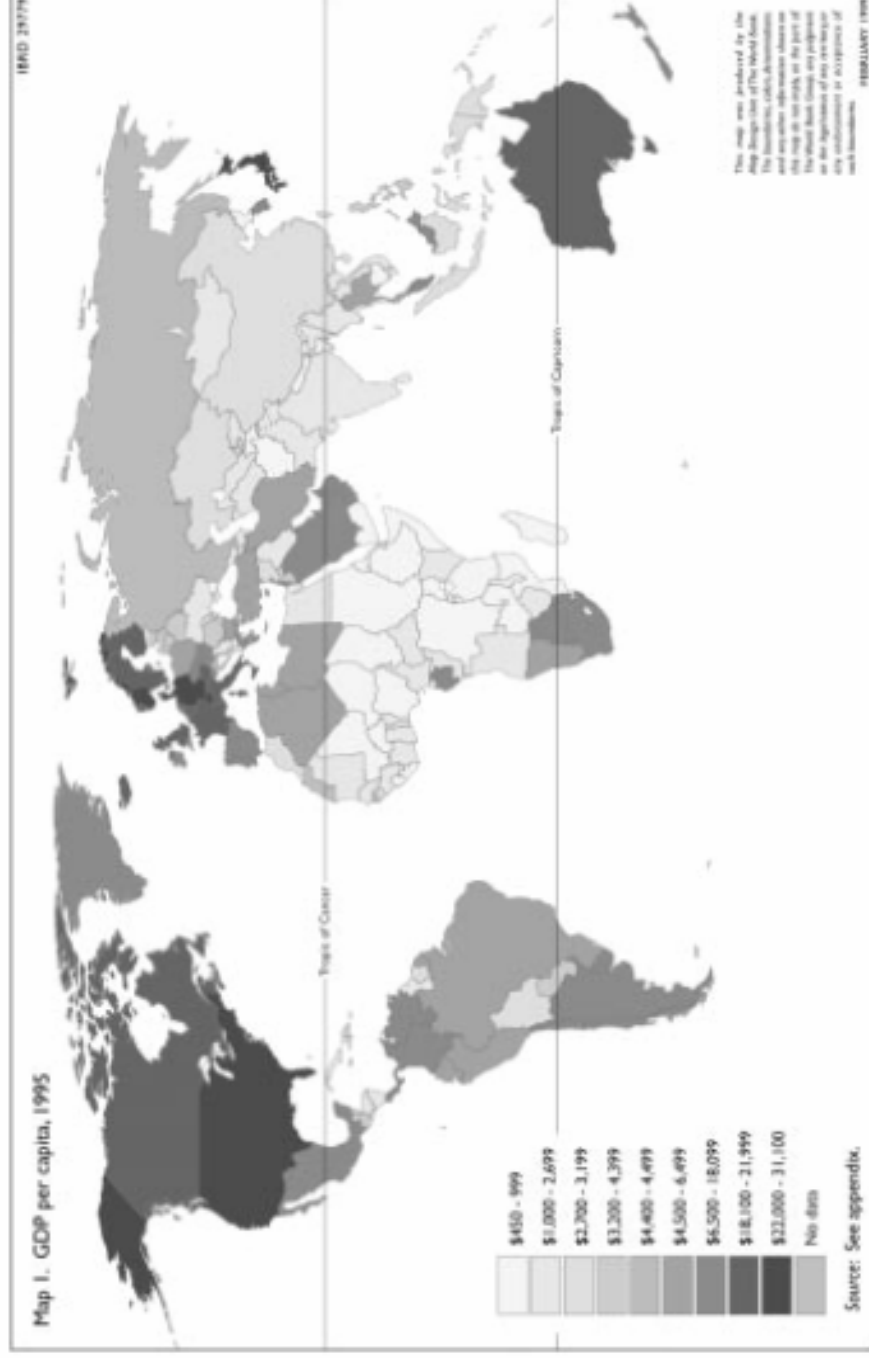
- (as we are about to see).

– Evidently, being located in the tropics is a problem for economic development even today

- (as suggested by the tabulation to the right)..

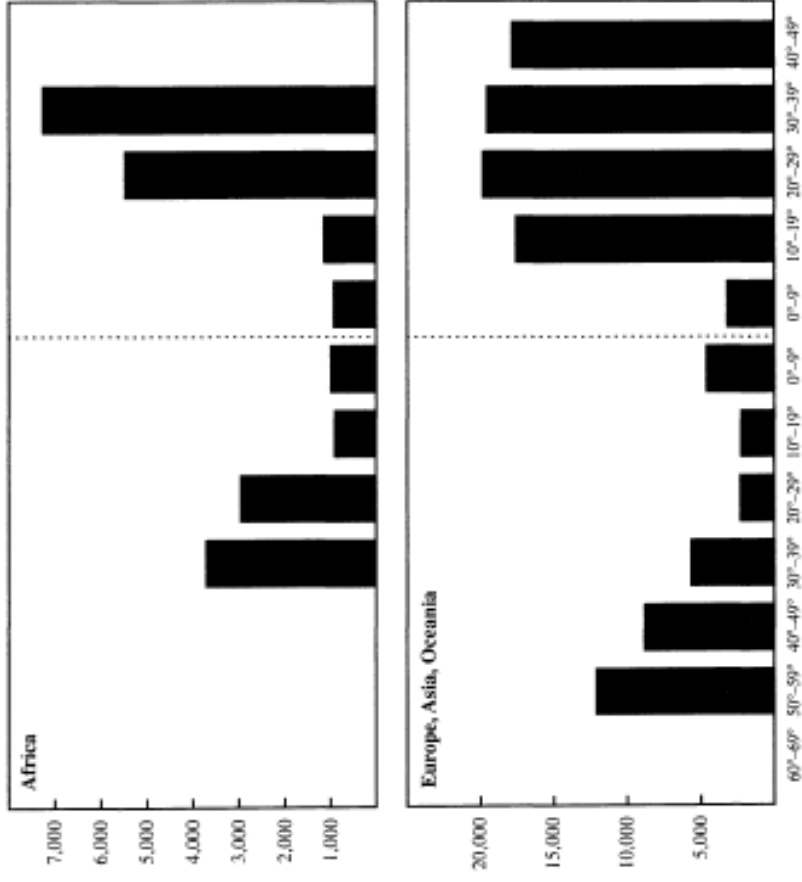


Same pattern is displayed here



Consider Africa as a case in point

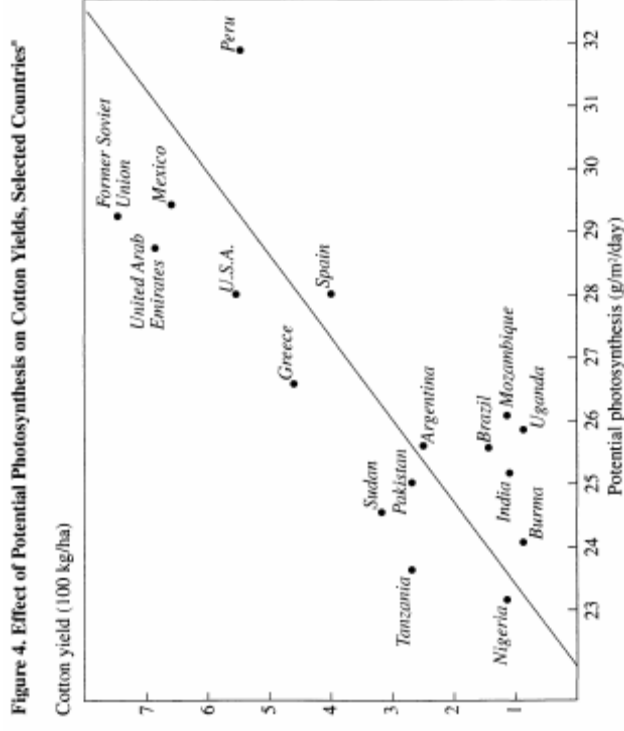
- Same is true *within* Africa.
- (But not, revealingly, within Europe...)



- It is argued that Africa's geography handicaps its economic "convergence" in at least three ways:
 - Low-productivity agriculture
 - Landlockness that hinders trade
 - A tropical climate that fosters malaria vectors and other disease burdens.
- We will consider them in turn.

Implications for Agriculture

- Climate does not support growing high-yield temperate crops (wheat, barley, paddy rice).
- Land lacks fertility except in interior highlands.
- Limited opportunities for irrigation due to lack of alluvial plans.
- Rainfall is heavily concentrated in certain seasons (leeching nutrients), subject to evaporation due to tropical climate, and unreliable.
- Evenness of growing day across seasons limits photosynthesis. (Lack of 12+ hour days during growing season reduces rate of photosynthesis.)

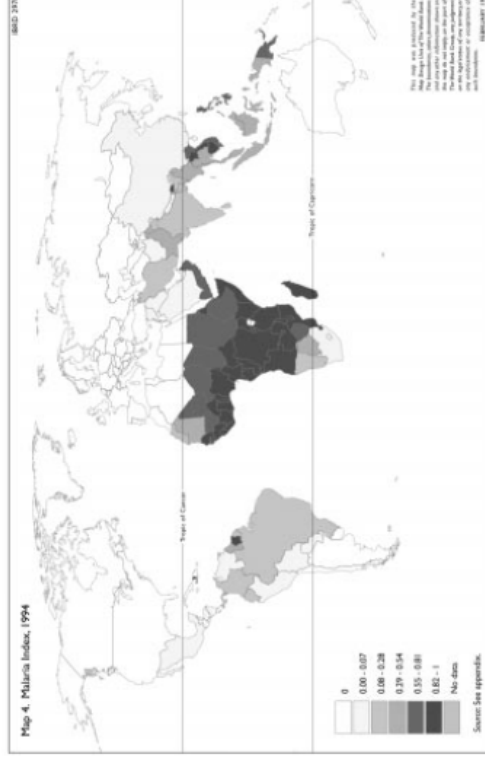


But Are Low Yields the Result of Climate or Institutions?

- Photosynthesis, rainfall, soil type etc. comprise one determinant of yields, to be sure.
- But because of the absence of insurance markets and financial markets on which to store savings, farmers are forced to scatter plots, intermix crops, and engage in other practices which limit yields.
 - (Recall our discussion of rationales for Europe's open fields.)
- Farmers who want to borrow to improve irrigation, drainage, etc. must do so informally, due to the absence of financial markets and institutions, at interest rates approaching 40 per cent. No surprise, then, that relatively few improvements .
- If drought is the constraint on yields, drought resistance seed types can provide an easy solution.
- Does this mean that the effects of geography and climate on agriculture are mutable? Can they be solved by technology, improved governance and market development?

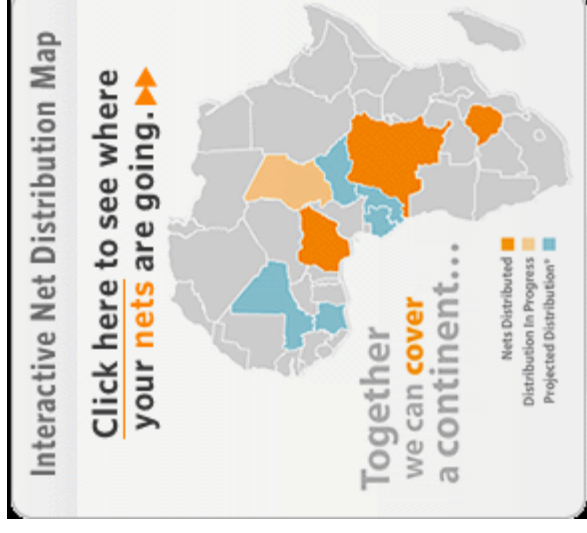
Geography and climate similarly have implications for disease burdens

- Constancy of temperature (no subzero temperatures) supports disease vectors and microbes.
- Association of malaria incidence with tropical climate is clear at right.
- Africa mosquitoes – unlike those in the U.S. South – are primarily human biters.
- Low incomes and lack of public health infrastructure then compound the problem: incidence of AIDS is 7 per 100 population, where in no other region does it exceed 1 per 100. 90% of the world's malaria deaths occur in Sub-Saharan Africa, the majority of them among children.



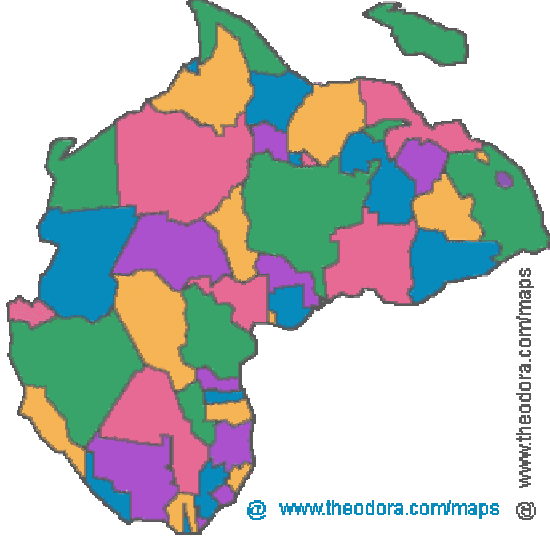
But is this an exogenous factor?

- Some would argue that with stronger governance and better institutions, African governments could deliver better public health services.
 - In this view, high incidence of health problems is endogenous – a consequence of other things (weak institutions), not a climatically- and geographically-determined cause.
 - Similarly, a little bit of foreign aid (insecticide coated bed nets) can go a long way toward solving this problem.

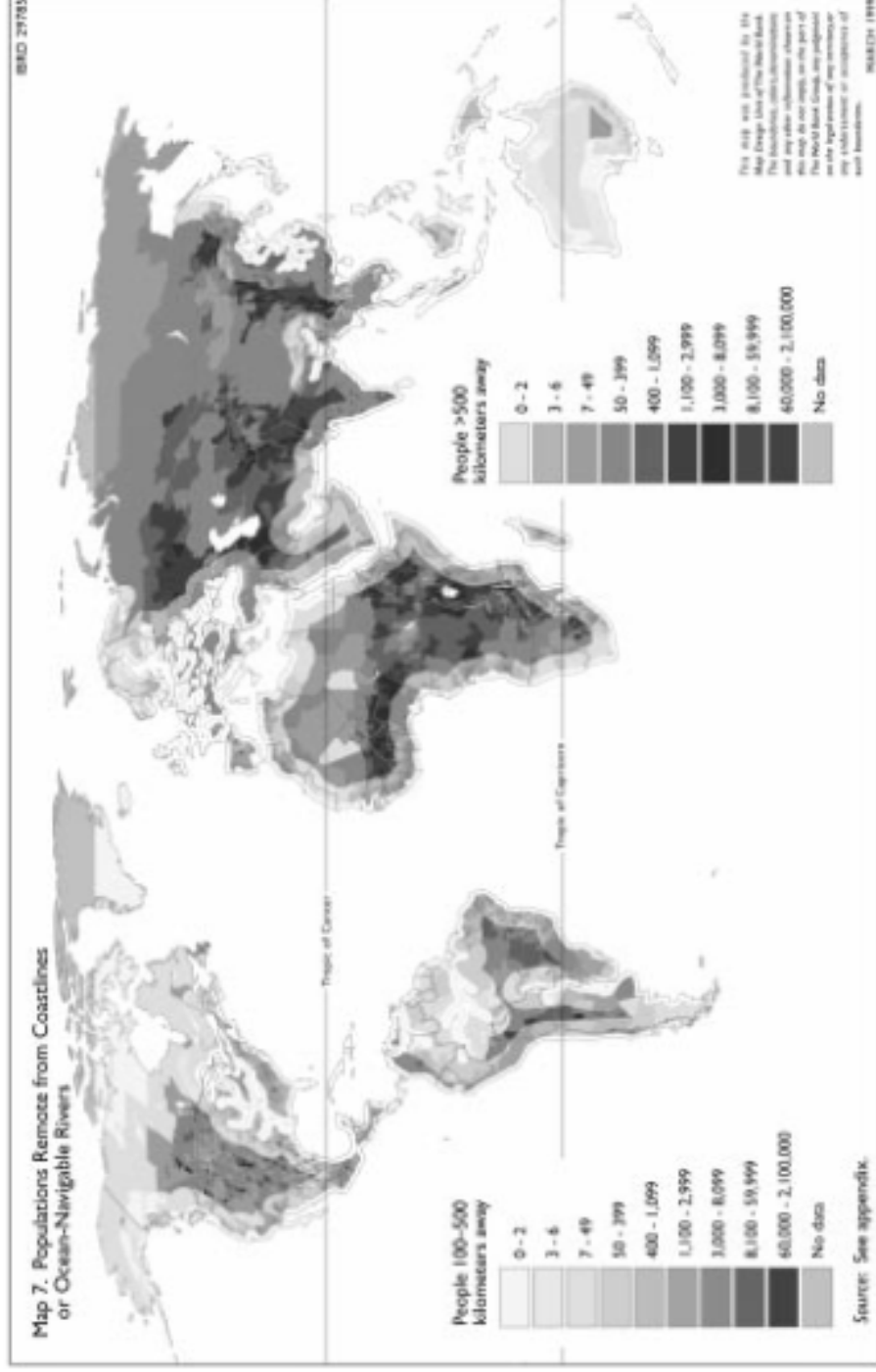


Implications for Trade

- Transport costs are high: hence difficulty of exporting.
- A disproportionate share of African countries are landlocked. Navigable rivers are few.
- Sahara cuts many countries off from richer Mediterranean markets.
- Temperate climate and more abundant rainfall in highlands causes population to concentrate away from coast (further discouraging trade).



Not exclusively in African problem, but heavily so



But aren't these problems again partly endogenous and subject to change?

- Roads can be built to the coasts.
- Location of population is endogenous (viz. air conditioning and American South)



Second hypothesis: burden of colonialism

- North America had the good luck of being colonized by the British and French, who believed in limited government with checks and balances.
- North America also imported the British legal system, which gave strong rights to property owners.
- South America had the bad luck of being colonized by the Iberians, who had no such tradition.
- Congo was colonized by the Belgians as King Leopold's personal fiefdom.
 - This interpretation is influential among Latin American economic historians in particular. See John Coatsworth, "Structures, Endowments and Institutions in the Economic History of Latin America."
- This is an example of very strong historical path dependence.
- Yet some one-time Spanish colonies seem to do much better than others (viz. Chile). This simple hypothesis (too simple) provides no explanation for such variation.

A reconciliation is the following

- Colonialism matters mainly because of the institutions it bequeaths.
- But it is not simply the identity of the colonizer but also the conditions that the colonists encountered that shaped the institutional inheritance.

– This is the argument of Daron Acemoglu, Simon Johnson and James Robinson, “The Colonial Origins of Modern Economic Development,” *American Economic Review* (2001).

Acemoglu, Johnson and Robinson (AJR) argue as follows

- Europeans founded extractive colonies or developmental colonies, depending on how hospitable local climate was for settlement.
 - Where malaria and other diseases killed off Europeans, they did not settle.
 - Where indigenous population density was high, they similarly did not settle.
- Where they settled, settlers demanded checks and balances, limits on arbitrary governance. Where they didn't, power was concentrated in the hands of the few. Institutions were designed to extract surplus, not promote development.

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- Where they settled, settlers demanded checks and balances, limits on arbitrary governance. Where they didn't, power was concentrated in the hands of the few. Institutions were designed to extract surplus, not promote development.
 - Compare Africa and Australia....

AJR have a clever way of implementing this analysis. What

do they do?

- Gather data on settler mortality way back when.
- Look at only that portion of current institutions correlated with settler mortality then.
- They can then argue that they are picking up the truly exogenous component of institutions.
 - Note that this is an argument for how history matters.
 - The clever part is that there is no reason why settler mortality 300 years ago should affect income and development now, except through the posited effect on institutions.

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ACEMOGLU ET AL.: THE COLONIAL ORIGINS OF DEVELOPMENT

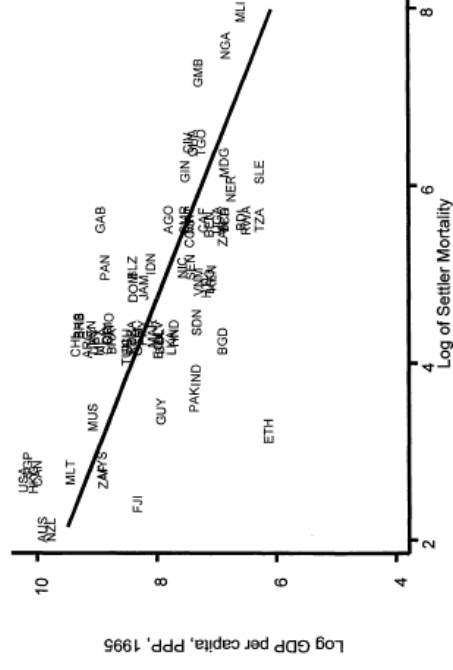


FIGURE 1. REDUCED-FORM RELATIONSHIP BETWEEN INCOME AND SETTLER MORTALITY

Channels through which development was affected

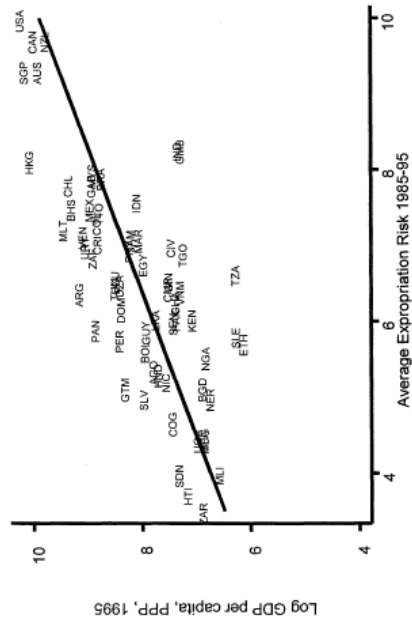


FIGURE 2. OLS RELATIONSHIP BETWEEN EXPROPRIATION RISK AND INCOME

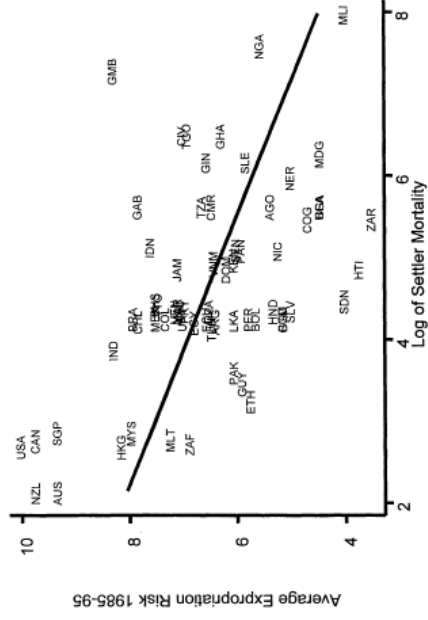
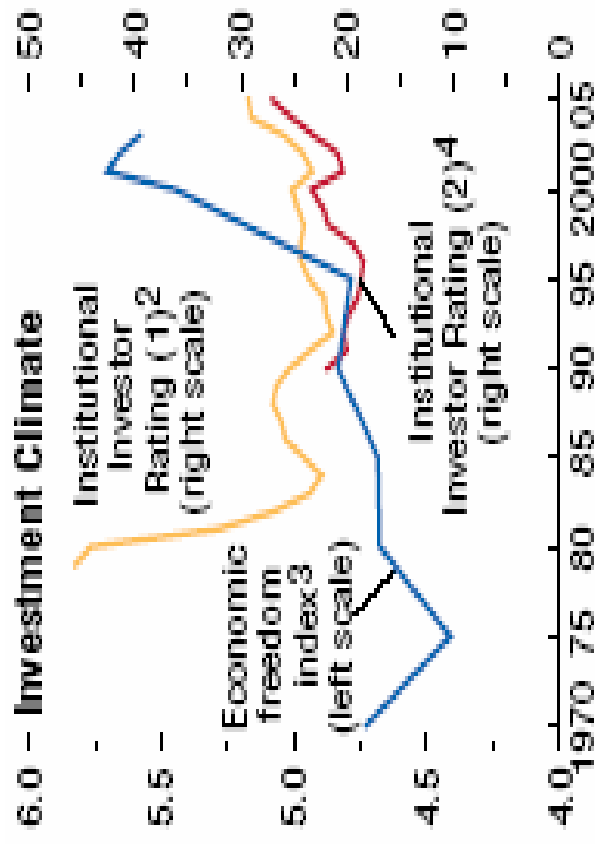


FIGURE 3. FIRST-STAGE RELATIONSHIP BETWEEN SETTLER MORTALITY AND EXPROPRIATION RISK

What are the problems with this story?

What are the problems with this story?

- It assumes very strong path dependence (determinacy).
- In practice, we know that institutions display some plasticity. (In Africa, most measures suggest that they have improved since 1995).



Further problems

- Are soldiers and priests representative?
- Barracks mortality or campaign mortality?
- Difficulty of mapping earlier colonial mortality into modern state borders.
- AJR have to work hard to explain some notable outliers (Botswana has grown successfully, by more than 7 per cent per annum for more than three decades) despite having been colonized by British settlers who experienced high mortality rates.
 - Thus, it must have been special:
 - Too remote for British to have an impact?
 - Diamonds?
 - Civic culture?
 - Something else?

Conclusions

- In explaining persistent divergence, it is important to remember that modern economic growth is associated with industry.
- And the environment for industry (transportation and communications technology, agglomeration economies) meant that when Europe industrialized, other parts of the world were deindustrialized.
- This explanation for 19th century divergence is incomplete, of course, because our explanations for Europe's industrial revolution are incomplete.
- In addition, we require explanations for the persistence of divergence. And here there is no shortage of candidates:
 - The burden of geography
 - The legacy of colonialism
 - Other factors making for weak institutions
- But if these explanations are so compelling, they should also provide an adequate explanation for why while tendencies toward convergence were so weak before the late 20th century, while it is now in full gear.
 - Do they? We will see next time.